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FINAL 886 CLUSTER CLOSURE PROJECT WASTE MANAGEMENT PLAN

RF/RMRS-98-230

April 23, 1998
Revision 0

ADMIN RECORD
B886-A-00016

FINAL
886 CLUSTER
CLOSURE PROJECT
WASTE MANAGEMENT
PLAN

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ADMINISTRATIVE INFORMATION

Site:	Rocky Flats Environmental Technology Site (RFETS), Golden, Colorado
Project Name:	Final 886 Cluster Closure Project Waste Management Plan
Date Prepared:	April 23, 1998

Approvals

I have read and approved this 886 Cluster Closure Project Waste Management Plan with respect to the hazards, regulatory requirements and objectives of the project.

Marcella C Broussard

Marla Broussard
RMRS 886 Project Manager

5/8/98
Date

Martin Wheeler
RMRS Waste Management Director

5/7/98
Date

Waste Management Plan
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LIST OF TABLES

ACRONYMS

ALARA	As Low As Reasonably Achievable
BIO	Basis of Interim Operation
D&D	Deactivation and Decommissioning
DOT	Department of Transportation
FSAR	Facility Safety Analysis Report
HEPA	High Efficiency Particulate Air
HEUN	Highly Enriched Uranyl Nitrate
IDC	Item Description Codes
MAL	Master Activity List
NDA	Nondestructive Assay
NTS	Nevada Test Site
RBA	Radiological Buffer Area
RCA	Radiological Contaminated Area
RFETS	Rocky Flats Environmental Technology Site
RMRS	Rocky Mountain Remediation Services
SCO	Surface Contaminated Object
SM	Safeguards Measurements
SSOC	Safe Sites of Colorado
WAC	Waste Acceptance Criteria
WGI	Waste Generator Instructions

1.0 Building 886 Facility Management

Building 886 Facility Management is responsible for operating the facility, maintaining the safety envelope, and conducting deactivation, decommissioning and decontamination operations. Operations personnel will generate and package waste during deactivation, decommissioning and decontamination operations. Operations personnel are responsible for ensuring compliance with the Waste Acceptance Criteria (WAC). Operations personnel will be trained and qualified under the site waste generator program.

2.0 Building 886 Waste Management

The Waste Management Project Manager is responsible for providing guidance to waste generators regarding regulatory compliance and waste management activities. The Waste Project Manager is responsible for interfacing with the Customer Service Representative to provide Waste Generator Instructions (WGI) and general technical support to the Project in regards to packaging and characterization for generating waste compliant with WACs and regulatory requirements, as well as getting waste scheduled to transfer for counting or storage. The Waste Project Manager is responsible for interfacing with other Deactivation and Decommissioning (D&D) projects to provide support to and get support from activities that are common to the projects. The Waste Project Manager is responsible to ensure that the Closure Project receives support that is necessary to remove waste that is generated during the deactivation activities.

The Waste Management Project Manager is responsible for interfacing with the Safe Sites of Colorado (SSOC) Safeguards Measurements (SM) organization to provide technical support for holdup measurements, and development of instrumentation for measuring Enriched Uranium contaminated waste. He/she is also responsible for interfacing with the Rocky Mountain Remediation Services (RMRS) Nondestructive Assay (NDA) organization to ensure support for counting Enriched Uranium contaminated waste for accountability and characterization.

3.0 Waste Types and Quantities from Building 886

Quantities and types of wastes resulting from B886 D&D activities are estimates, and summarized from individual project descriptions. This information is subject to change. A program of Pollution Prevention and Waste Minimization will be employed wherever possible in this project in order to reduce the amounts of wastes produced. Materials will be evaluated for their potential to be reused or recycled, either at Rocky Flats Environmental Technology Site (RFETS), or other facilities, prior to being declared waste.

The amount of secondary waste generated will be one of the criteria evaluated in selecting the most efficient and cost effective decontamination technique when decontamination of equipment is required. Waste minimization practices also includes Radiological Engineering evaluation for free release of materials, and transfer of equipment to organizations that can use such equipment.

4.0 Waste Form Process Flows

This section describes the process flows for waste forms that will be generated during Building 886 deactivation, decontamination, and decommissioning. Each process flow describes its purpose, the item description codes (IDC), or waste types included in the process flow, background information, process flow for management and disposition of the waste, and outlines decisions that will need to be made during handling of a particular waste. Addendums to this plan will be incorporated as necessary once final handling determinations are made. Real-time schedules of waste generation will be provided to Waste Operations on a routine basis to facilate incorporation into the Waste Processing Schedules.

4.1 Process flow for combustible waste forms

Wastes included in this section have been profiled, identifying assay and packaging methodology for Enriched Uranium, for disposal at the Nevada Test Site (NTS). Changes or alternatives to this methodology will be profiled for NTS approval.

Scope

This process flow is applicable only to combustible wastes generated in the Building 886 Cluster. Combustible waste forms include:

IDC	Description
330	Dry Combustibles
335	Absolute Dry Box Filters-Not Acid Contaminated
336	Moist Combustibles
337	Plastic (PVC, Teflon, etc...)
490	HEPA Filters (24 x 24)
491	Pre-filters

Background

Combustible waste forms, listed in the scope above, are generated in the Building 886 Cluster during routine facility operations and deactivation; and are expected to be generated during decommissioning activities. These waste forms may be radioactively contaminated at low levels. The majority of these wastes will be contaminated with Enriched Uranium. Some minimum amounts of Plutonium 238 contaminated waste will be generated. The only Plutonium contaminated waste will be generated from deactivation of the glovebox and down draft room in room 103.

A large portion of these wastes are radioactive by default since they are generated in a Radiological Buffer Area (RBA) or a Radiological Contaminated Area (RCA). The cost of obtaining free release per the DOE No Radioactivity Added Policy exceeds the cost of radioactive waste disposal. Radiological assay support is being developed by the SSOC Safeguards Measurements organization, as well as the RMRS NDA organization. Alternatives for nondestructive assay support are also being appraised in the event that support from above organizations in not available. This waste form and potential alternatives for measuring or assay, are identified is tables throughout the waste management plan

4.2 Process Flow for Raschig Rings

Wastes included in this section have been profiled, identifying assay and packaging methodology for Enriched Uranium, for disposal at the Nevada Test Site (NTS). Changes or alternatives to this methodology will be profiled for NTS approval.

IDC	Description
441	Unleached Raschig Rings

Background

Raschig rings are borosilicate glass rings (cylinders) which are one and three-quarter inches long with a one and one-half inch outer diameter. They are used as neutron absorbers in process tanks to prevent criticality of solutions of fissile material. These raschig rings are contaminated with Enriched Uranium from direct contact with highly enriched uranyl nitrate (HEUN) solution. Raschig ring waste is being generated and managed through deactivation of the systems identified in table 9-4.

4.3 Process Flow for Light Metal, Concrete, and Glass

Wastes included in this section have been profiled, identifying assay and packaging methodology for Enriched Uranium, for disposal at the Nevada Test Site (NTS). Changes or alternatives to this methodology will be profiled for NTS approval.

Scope

This process flow is applicable only to light metal, concrete, and glass wastes generated in the Building 886 Cluster. Light metal, concrete, and glass waste forms include:

IDC	Description
374	Blacktop, concrete, dirt and sand
440	Glass, (except raschig rings)
480	Light metal (stainless steel, aluminum, etc.)

Background

Metal, concrete, and glass waste forms listed in the scope above, are generated in the Building 886 Cluster during routine facility operations and deactivation; and are expected to be generated during decommissioning.

Decision Elements

The Waste Generator with support from the Customer Service Representative and Waste Generator Instruction, will package waste to comply with established Waste Acceptance Criteria.

5.0 Conduct of Operations

All operations and activities conducted in Building 886 Cluster, including waste generation, must comply with RFETS Conduct of Operations' requirements. Activities must be approved on the site's Master Activity List (MAL) and be authorized under the facility authorization basis. All activities require approved written instructions.

Waste management activities are addressed on the MAL under Baseline activity B-9, Environmental Compliance and B-11, Waste management. The Authorization Basis for Building 886 is the Basis of Interim Operation (BIO). Storage of waste in the Building 886 Cluster is approved under the BIO. Operations are conducted per approved procedures and operations orders. Questions regarding Conduct of Operations should be directed to the Facility Manager.

Storage of waste in facilities outside of the Building 886 Cluster must be reviewed and approved by the Facility Manager of the area where waste is to be stored. The Facility Safety Analysis Report (FSAR), or equivalent authorization basis, must define and approve storage of Enriched Uranium contaminated wastes and should address particular storage requirements for the facility.

6.0 Nuclear Safety

Enriched Uranium is a fissile nuclear material. All activities regarding handling and storage of Enriched Uranium contaminated waste must be reviewed and approved by RFETS Nuclear Safety and Criticality Safety. Waste storage in the Building 886 Cluster has been reviewed and approved. Documentation is located in the Shift Manager's office. Facility Management and the Project Waste Management will identify storage locations with the appropriate nuclear safety approvals. Specific requirements for storage of Enriched Uranium waste, outside of the Building 886 Cluster include nondestructive assay to demonstrate the fissile material content of each container. Building 886 Deactivation personnel are working with Waste Management, Safeguards and Accountability, and offsite vendors to ensure compliance to these requirements.

7.0 Deactivation Activities

This waste management plan identifies the method in which waste generated from the Building 886 Cluster Closure Project will be managed. At the time of this writing, there are limited options available to support the generation of waste in the area of Nondestructive Assay (NDA), for accountability and waste characterization. There are some assumptions that assay equipment will be made available, and that the Safeguards Measurement organization provide necessary support to perform gram estimates from radiometric scans for compliant waste packaging. These assumptions have been made for the purposes of planning. The following table identifies the current status of available Nondestructive Assay capabilities to support the waste generation from the Building 886 Closure Project.

As identified, the option most available to the Building 886 Closure Project is drum counting. The following waste management plan identifies the optimum packaging configuration and number of containers that will be generated as part of the deactivation activities as well as the decommissioning activities. Minimizing the use of full-size or half-size waste crates will be very costly to the Building 886 Closure Project because of the cost and time associated with size reducing material to fit into a 55 gallon drum.

Table 7-1 Projected NDA Equipment Availability

NDA Equipment	Container Type	Calibrated for Enriched Uranium	Current Status
Segmented Drum Counter Bldg. 371	55 gallon drums	Yes IDC specific	Scheduled for EU calibration
Passive/Active Drum Counter Bldg. 371	55 gallon drums	No	Scheduled for EU calibration
Passive/Active Crate Counter Bldg. 569 No alternatives available at this time	Full-size waste crate ½ -size waste crate	No	methodology developed to calculate Enriched Uranium value only calibrated for light metal at this time
Canberra Drum Counter Bldg. 664	55 gallon drums	yes	unavailable for measuring uncounted drums- 664 FSAR could possibly be relocated to support the B886 Project, very costly
Los Alamos Tomographic Segmented Gamma Scan	55 gallon drums	yes	available with contract
HEPA/Losac Counter Building 776	55 gallon drums HEPA Filters	No	Scheduled for EU calibration

8.0 Waste Inventory in Building 880

As part of the Deactivation activities, the inventory of waste in Building 880 is being consolidated, where practical, and packaged for disposal. The type of waste in Building 880 consists of equipment and material that has been identified as excess from Building 886. Because there is no documented historical information on the equipment and material that is in Building 880, radiological surveys are required to be performed to determine the disposition of the material and what disposal criteria must be met to dispose of it.

All but one shelf, and one cabinet have been dismantled and packaged as IDC 480 metal into 2 full-size waste crates. The packaging activity has been observed by a Quality Assurance Waste Inspector to ensure compliance to the packaging requirements, and to eliminate the necessity to RTR (a request for exemption to the RTR requirement has been submitted to the Low Level Waste Program and approved). These waste crates will be transferred to Building 569 to be crate counted prior to disposal.

8.1 HEPA Filters

One full size waste crate containing 8 HEPA filters is staged to be transferred to Building 776 for assay. At this time the Project is working with the Waste Management Scheduling and Transfer Group to have the crate scheduled. Once assayed, it will be transferred to Building 664 or 440 to store until disposed of off-site.

8.2 Borax Tubes

Three wooden manufacturer crates containing what is identified as borax tubes, were opened to verify contents. One of three crates consists of cardboard tubes that are filled with borax soap powder, the other two crates were empty. The tubes identified in the one crate, may have been utilized in the experiments that were conducted in Building 886, so they must be packaged as potentially radiologically contaminated waste. These tubes were packaged into one half crate. The three manufacturer crates were disassembled and the wood was packaged into a full-size waste crated as low level waste. The crate with the borax tubes as well as the crate with the wood in it will be counted for accountability and characterization prior to off-site disposal.

8.3 Concrete

There are 6 slabs of concrete measuring 8' x 4' x 8" that may have been utilized for shielding in Building 886 experiments. These concrete slabs have some rough areas that cannot be surveyed for contamination, and some of the slabs have some kind of coating on them that cannot be surveyed. These slabs will be managed as potentially radiologically contaminated and must be packaged as low level waste for disposal. This concrete will be very labor intensive to size reduce into pieces small enough to load into a waste crate safely. The concrete is estimated to weigh approximately 250-300 pounds per cubic ft. Each slab would bring a full-size waste crate to its weight capacity.

8.4 Experimental Plastic

There are three wooden crates that are labeled as "experimental plastic" that each have 4 sheets of what appears to be plexi-glass. These sheets are approximately 5 feet long, by 4 feet wide, by 6 inches thick, weighing approximately 300 to 400 pounds each. Preliminary radiological surveys have indicated low levels of contamination. It is unknown if these sheets of "plastic" were utilized in the Building 886 experiments. The dimensions of the "plastic" sheets would prevent them from being packaged into a full-size waste crate without size reduction. The density of the plastic will also fill the waste crate to its weight capacity without physically filling it. The Project is pursuing use of cargo containers to dispose of material such as this, and the concrete described above, as long as it can be demonstrated to meet DOT criteria for Surface Contaminated Object (SCO) waste.

8.5 Metal Plates

There are 2 small odd-size wooden crates that are banded and identified as "BSS Plates". There is no historical information available on these containers. They were scanned by the safeguards organization for radiological activity and none was identified. It is unknown if these plates were utilized for the Building 886 experiments. Once these crates can be transferred to a controlled area and opened, a determination will be made for final packaging and disposal.

8.6 NRC Plastic

There are 2 manufacturer crates that are stenciled "NRC Plastic" staged outside of Building 880. There are signs "radio-actively contaminate" stapled to these crates. These crates will be relocated into Building 880 to open and identify the contents, and to determine final disposition.

8.7 Empty Tank

There is a tank that is tack welded to a 4ft. x 4ft. pallet, that is labeled as internally contaminated. There is no documented history available to identify what the tank was used for, or if it was used in the experiments conducted in Building 886. The Project is proposing to remove the flanges that are on the tank drain lines and have radiological surveys performed to provide information to characterize as Surface Contaminated Object (SCO).

8.8 SUMMARY

As referenced above, the Building 886 Closure Project is in the process of defining requirements to package the above identified items in bulk, into a DOT approved cargo container for shipment to disposal. This would be the most economical disposal method for off-site disposal. It will be very labor intensive to have to size reduce the identified material into sizes small enough to fit into a full-size waste crate or 55 gallon drum. Because of density and the dimensions of the identified material, it will require that multiple partially filled containers will be generated to maintain compliance to weight limitations for packaging this material, or a significant amount of size reduction will be required. This situation is not consistent with waste minimization. Also of concern is the ALARA concept, and of personnel spending extended periods of time making multiple moves of the material for purposes of size reducing and packaging. Limiting the number of times that personnel has to handle these large heavy pieces of material also decreases significantly, the potential for accident or injury.

Table 8-1 Projected number of containers for Building 880

scenario #1	scenario #2	scenario #3
3 full size waste crates	14 full size waste crates	140 fifty five gallon drums
2 half size waste crates		
1 cargo container		
No size reduction required	Size reduction required	Extensive size reduction required

9.0 Building 886

9.1 Horizontal Split Table Disposition

The Horizontal Split Table located in the Critical Mass Laboratory in room 101 was used in support of the criticality experiments. There is a possibility that the Criticality Mass Laboratory in Los Alamos, New Mexico, is interested in having the horizontal table transported to them. In the event that this transfer does not occur, the table must be in a condition to be packaged to conform to requirements for disposal. This table could easily be included in the bulk packaging into a cargo container.

Historical documentation identifies that the horizontal split table does have low levels of Enriched Uranium contamination. It will be very labor intensive to disassemble the table to decontaminate it to a level that it can be free released. It will also be very labor intensive to disassemble the table and to package it into full-size waste crates or drums.

The Horizontal Split Table is made up of six major components, each of which is very heavy with a lot of bulk. The total dimensions of the table are 18 feet long x 7 feet wide x 4 feet tall. The total weight of the table with all components is approximately 10,000 pounds.

The Project has selected the horizontal table to be part of the bulk waste transfer inside a cargo container. If the bulk waste transfer does not occur, the table will be disassembled to comply with the maximum weight capacity of a full-size waste crate which is 5,000 pounds, or meet with the physical limitations of the waste crate.

The hydraulic system associated with the horizontal table will be drained and the hydraulic fluid collected for disposal.

Table 9-1 Projected waste generated from Horizontal Split Table

Item Description Code	Description	Volume	Comment
480	light metal	1 cargo container-limited disassembly, no size reduction	radiological surveys performed/calculations performed by Rad Eng dispose of as Surface Contaminated Object
480	light metal	3 full-size waste crates, disassembly, size reduction	same as above
480	light metal	30-40 fifty five gallon drums, extensive disassembly, extensive size reduction	same as above
	hydraulic fluid	2 gallons	sample analysis will be necessary for final disposition and disposal

9.2 Assembly Hood Room 101

Piping associated with the tanks and pumps in the assembly hood will be removed as part of deactivation. Disposition of the piping will be determined by hold-up measurements performed by the Safeguards NDA organization.

Table 9-2 Projected waste generated from tank deactivation

Item Description Code	Description	Volume	Comment
480	Light metal pipe	2 fifty five gallon drums	Hold-up scans will determine the length of pipe pieces that are packaged to stay under the maximum of 15 grams per container for Low Level Waste.

Decontamination of the inside of the assembly hood will be done in an effort to minimize the containment requirement for removal of the front wall of the assembly hood prior to removal of the tanks and the vertical table.

Table 9-3 Projected waste from Assembly Hood

Item Description Code	Description	Volume	Comment
337	Plastic wall	one half crate with size reduction required bulk load into cargo if wall meets SCO requirements	The plastic wall will be surveyed for removable contamination as well as scanned for hold-up
480	Light metal frame	one half crate with size reduction required bulk load into cargo if frame meets SCO requirements	The metal frame will be surveyed for removable contamination as well as scanned for hold -up
336	moist combustibles	3 fifty five gallon drums	Estimated volume of waste that will be generated as a result of the decontamination effort

9.3 Raschig Rings

Room 101 contains four raschig ring filled tanks that were used for storage of HEUN solutions. The rings are non-RCRA regulated, Low Level Waste. Raschig rings remain to be removed from tanks T1, T2, 540 and 541. These four tanks contain an estimated 43,000 raschig rings. A waste profile for Nevada Test Site was approved on 5/16/97, for disposal of the rings.

Table 9-4 Projected waste generated from Raschig Ring Removal

Item Description code	description of waste	volume of waste	comment
441	raschig rings	80 - 100 drums	Packaging configuration is 30 gallon drum inside a 55 gallon drum per DOT requirement for >15 grams U
330/336	dry/moist combustibles	30 drums	55 gallon
337	plastic	5 drums	55 gallon
480	light metal	2 drums	55 gallon

A possibility exists that the Safeguards Measurement Organization may be able to support the raschig ring removal project with instrumentation to estimate radiological activity of each package. The bags of rashig rings will be estimated prior to packaging them into a fifty five gallon drum instead of a thirty gallon drum. It may also be possible to package the raschig rings into a half waste crate instead of 55 gallon drums. This packaging scheme will minimize the number of containers that is generated. The Project is still working with the Safeguards measurement organization to make a determination on the feasibility of using their instrumentation for gram estimation. Also, the determination for criticality safety review, evaluation and approval will have to be acquired for utilizing the full and half crates in the Building 886 cluster for waste packaging.

9.4 Annular Tank Deactivation

There is an annular reactor vessel located on the mezzanine of room 101 in Building 886. This tank was used for criticality experiments until 1989. The tank has a 4.25 inch annulus and is wrapped in boroflex and 3" polyethylene shielding. The deactivation project includes stripping of the boroflex and the polyethylene shielding, cleaning the tank, and disposal of all material.

The tank and shielding are radioactively contaminated with Enriched Uranium. Waste generated from this project will be low level waste, destined for the Nevada Test Site. Waste will not be RCRA regulated. The manufacturer specifications for Boroflex have been reviewed. No regulated constituents are present. No RCRA regulated processes were used in the experimental processes.

Waste will be packaged to minimize the generation of waste containers. Waste will then be measured to comply with the RFETS safeguards accountability requirements, as well as the Nevada Test Site waste acceptance criteria.

Table 9-5 Projected waste generation from Annular Tank deactivation

Item Description Code	Description	Volume	Comment
To be determined	Boroflex Shielding	1 half-size waste crate 5 fifty-five gallon drums	excess boroflex identified in room 101 will be surveyed for free release
337	Plastic	3 fifty-five gallon drums	generated from plastic containment
336	Moist combustibles	1 fifty-five gallon drum	generated from wiping down tank and clean up
480	Light metal	Packaged into cargo container to dispose of as bulk, if surveys and scans are low enough (no size reduction) Size reduced and packaged into multiple full size waste crates if survey or scan levels dictate	surveys will be performed to support characterization calculations and hold-up scans will be performed for gram estimation

9.5 Removal of Tanks

Tanks T1, T2, 540 and 541 were used to mix the uranal nitrate solution used in the experiments. Removal of tanks T1, T2, 540, and 541 is necessary prior to removal of the vertical table. Draining of hydraulic lines associated with the vertical table is necessary prior to removal of the table.

Table 9-6 Projected waste generation from Tank Removal

Item Description Code	Description	Volume	Comment
	Hydraulic Fluid	2 gallons	Hydraulic fluid must be sampled and analyzed for disposition and disposal
337	Plastic tanks	tanks will be size reduced to fit into full waste crates or disposed of as SCO	The tanks will be surveyed for removable contamination as well as scanned for hold-up for packaging configuration
480	Metal tanks	same as above	The tanks will be surveyed for removable contamination as well as scanned for hold-up for packaging configuration

The tanks will be surveyed internally to determine the waste characterization. There are three possibilities for packaging configuration as a result of the characterization. They are as follows:

Table 9-7 Projected waste packaging from Tank Removal

Surface Contaminated Object	Low Specific Activity	Low Level Waste
Tanks will be packaged with no size reduction, into an approved cargo container in bulk to dispose of	Tanks will be size reduced based on values from the waste characterization to meet the packaging criteria for less than 15 grams Enriched Uranium per container (packaged into wooden full-size waste crate)	Tanks will be size reduced based on values from waste characterization, NDA hold-up scans to meet packaging criteria for less than 15 grams U per container. (packaged into full-size, half-crate or drum, as required by estimated value)

9.6 Removal of Vertical Split Table

The vertical split table will be surveyed to identify levels of contamination to establish waste characterization. Waste characterization will determine the way the vertical table is packaged for disposal. The packaging possibilities are the same options identified in the above table. The miscellaneous equipment/material (pumps and approximately 1600 ft of pipe) remaining from the tank and vertical table removal will be surveyed for contamination, scanned for hold-up, and packaged accordingly to comply with disposal requirements.

Table 9-8 Projected waste generation from Vertical Table removal

Item Description Code	Description	Volume	Comment
480	Light Metal pipe pumps	2 drums Pipe cut into 6.5ft lengths, packaged into 4 half-size crates, Pipe cut into 30 inch lengths, packaged into	DOT package, 30 gallon drum inside 55 gallon drum: Packaging scheme required if material is >15 grams Enriched Uranium

		25 fifty five gallon drums 3 fifty five gallon drums	packaged to comply with material < 15 grams Enriched Uranium

9.7 Disassemble Assembly Hood

After the tanks and vertical table have been removed and packaged from the assembly hood, the assembly hood will be disassembled and packaged to comply with disposal requirements.

Table 9-9 Projected waste generation from Assembly Hood removal

Item Description Code	Description	Volume	Comments
480	Light metal	Packaged into cargo container for bulk disposal if levels are low enough.(no size reduction) or 1 full-size waste crate size reduction required, for rad levels identified by calculation or scan	material will be surveyed for contamination levels for characterization calculations, and scanned for hold-up
337	plastic	Packaged into cargo container for bulk disposal if levels are low enough (no size reduction) or 1 full-size waste crate, size reduction required for rad levels identified by calculation or scan	material will be surveyed for contamination levels for characterization calculations, and scanned for hold-up

9.8 Removal of Ventilation

After the removal of the assembly hood, the ventilation ducts will be removed. Possibility of contamination exists in the ventilation ducts. Radiological surveys will determine containment requirements for disassembly of the ventilation duct work.

Table 9-10 Projected waste generation from Ventilation removal

Item Description Code	Description	Volume	Comments
480	Light metal	2 full-size waste crates	surveys will be performed for contamination levels for characterization calculations, and scanned for hold-up

10.0 Building 886, Room 103

10.1 Tank Removal

Room 103 has 10 tanks that will be removed as part of the deactivation project.
The tanks will be disconnected and blanked off prior to removal. The tanks will be lifted with a crane to have the legs cut to a short enough length to put onto a cart to relocate to room 101 for packaging and disposal.

Table 10-1 Projected waste for tanks in room 103

Item Description Code	Description	Volume	Comments
480	Light Metal	Volume of waste generated will be dependent on the radiological surveys and the Safeguards hold-up scans.	Packaging requirements will be determined by the surveys that are conducted and the calculations. If possible, no size reduction will be done, the tanks will be packaged in bulk in an approved cargo. If size reduction is required, the tanks will be size reduced to fit into a full-size waste crate. If extensive size reduction is required, the metal from the tanks will be packaged into 55 gallon drums.

10.2 Glovebox and Downdraft Room Removal

Two gloveboxes and a downdraft table in room 103 were utilized to introduce radioactive material into the process stream for experiments conducted in the critical mass lab. Enriched Uranium and plutonium contamination exists in this equipment. The two separate gloveboxes are attached to the downdraft room with a flanged connection. The west glovebox is 8' tall x 4'wide x 5' long, the south glovebox is 8' tall x 4'wide x 4' long. These gloveboxes have legs that are 3' long. The gloveboxes can be disconnected from the downdraft room by disconnecting the flange fitting. A blank will have to be put into place at the flanged opening during the removal of the glovebox. The glovebox will have to propped up in order to remove the legs. The glovebox height will prohibit moving it through the doorway standing up. The height and width will prohibit packaging into a waste crate without some size reduction. After size reducing, the pieces of glovebox can be transferred to room 101 for packaging into a full waste crate or wrapped in plastic to be transferred to a cargo container as bulk waste. These gloveboxes will be decontaminated prior to removal.

Table 10-2 Projected waste generated from glovebox removal

Item Description Code	Description	Volume	Comments
480	Light metal	minimum of 2 crates per glovebox dependent on size reduction to fit into 4'x4'x7' waste crate 1 fifty five gallon drum	gloveboxes will be decontaminated and may be shipped as SCO waste. Size reduction required to remove from room 103.
330	dry combustibles	3 fifty five gallon drums	generated from the plutonium decontamination
336	moist combustibles	3 fifty five gallon drums	generated from the plutonium decontamination
337	plastic	1 fifty five gallon drum	generated from containment
339	leaded dry box gloves	1 fifty five gallon drum	generated from glovebox decontamination
490	HEPA filters (24x24)	1 filter	size reduce to fit into a fifty five gallon drum or transfer to a HEPA filter crate

10.3 Downdraft Room removal

The downdraft dimensions dictate that it be size reduced in order to remove it from room 103 into room 101 for packaging and disposal. Containment and air mover will be required for dismantling and removal of downdraft room.

Table 10-3 Projected waste from Downdraft Room removal

Item Description Code	Description	Volume	Comments
480	Light Metal	two 4'x 4'x 7' waste crates	size reduction required to remove from room 103 and to meet packaging requirements
330	dry combustibles	3 fifty five gallon drums	generated from plutonium decontamination
336	moist combustibles	3 fifty five gallon drums	generated from plutonium decontamination
337	plastic	2 fifty five gallon drums	generated from containment

10.4 Stainless Steel Wall

The stainless steel wall located in room 103 will have to be removed in order to remove three tanks. The wall dimensions are approximately 9' tall x 20' long x 1/8 " thick. The wall will have be size reduced to remove from room 103 to room 101 for packaging. Additional size reducing will have to be done after the pieces are relocated to room 101 in order to be sized to fit into a 4' x 4' x 7' waste crate, or surveyed to dispose of as SCO waste.

Table 10-4 Projected waste from Stainless Steel Wall removal

Item Description Code	Description	Volume	Comments
480	Light Metal	two 4' x 4' x 7' full waste crates survey for SCO category, bulk load into cargo container	weight limitation on the waste crate is limiting factor for loading Total weight of bulk load, will factor how much is loaded into cargo container

10.5 Cabinet and Hood

The cabinet and hood in room 103 will be removed and relocated into room 101. Packaging will be determined by the radiological surveys and hold-up scans.

Table 10-5 Projected waste generated from Cabinet and Hood removal

Item Description Code	Description	Volume	Comments
480	Light Metal	Volume of waste generated will be dependent on the radiological surveys and the Safeguards hold-up scans. One full crate or packaged as SCO and loaded into cargo container	Packaging requirements will be determined by the surveys that are conducted and the calculations. no size reduction will be done, the cabinet and hood will be packaged in bulk in an approved cargo. If size reduction is required, they will be size reduced to fit into a full-size waste crate. If extensive size reduction is required, the metal will be packaged into 55 gallon drums.

10.6 Carpet Removal

Carpet in the front office area of Building 886 will be removed and disposed of as non-radioactive, non-hazardous waste.

Table 10-6 Projected waste generated from carpet removal

Carpet	Volume	Comments
	One 20 foot roll off	carpet will be spot surveyed for radioactive contamination as it is being removed

11.0 Building 828 Process Pit

Building 828 is a process waste facility supporting Building 886 housing two process waste tanks, tank 440, and tank 449. Tank 440 is a 500 gallon process waste tank that served floor

drains and sinks in the criticality mass laboratory. It is expected to contain small amounts of Enriched Uranium. It is estimated to contain 25,000 raschig rings. Tank 449 is a 500 gallon tank that served as a scram repository for experimental apparatus in the criticality mass laboratory. There is no record of the scram system being activated during experiments. It is not expected to have significant amounts of contamination.

In May, 1995, Building 828 pit filled with significant quantities of ground water. The water level is believed to have been higher than the tank vent levels and the tanks are believed to be full of ground water. The deactivation project will include determining if the tanks contain waste, sampling, and shipping the waste.

Raschig rings will be removed from these tanks using a similar process to that of the room 103 ring removal. Based on process knowledge, these raschig rings are not expected to exceed the 15 gram per drum transportation limit. Therefore, these rings will be packaged in 55 gallon drums, or in half crates. Safeguards Measurements will be used to perform gamma spectroscopy on the tanks prior to the ring removal to estimate Enriched Uranium hold-up in the tanks.

The raschig rings and secondary waste from Building 828 are not expected to be RCRA regulated. There were no regulated constituents or processes associated with the filter plenums. It will be necessary to sample the rings for RCRA regulated metals and radiochemistry, including gram per gram and isotopic analysis, for the NTS waste profile. Raschig rings will be sampled during the ring removal process. Waste will be stored on site until analytical results and assay are completed. Waste will then be transferred to RMRS Waste Management or shipped directly to the Nevada Test Site (NTS).

Table 11-1 Projected waste generation from Building 828 Deactivation

IDC	Description	Volume	Comment
441	Raschig Rings	30 drums 6 half crates	packaged appropriately to address Enriched Uranium content
330	Dry Combustibles	7 fifty five gallon drums	
336	moist combustibles	7 fifty five gallon drums	
337	plastic	6 fifty five gallon drums	generated from containment house, tank ports, misc. plastic
TBD	Waste water	1,000 gallons	transfer to Building 374
480	Light metal	10 fifty gallon drums 2 half crates	miscellaneous metal ancillary piping, pumps etc.

12.0 Building 875 Utility Support for Building 886

Building 875 houses two High Efficiency Purifying Air (HEPA) filter plenums, and one deluge tank. Filter plenum FP501 has two stage HEPA filtration (12 filters per stage, and 12 mist eliminators) that support the office area of Building 886. These filters are assumed to be free of any contamination, but will have to assayed. The FP501 plenum dimensions are 10'H x 15'W x22'l., with support structure inside for the two stages of HEPA filters. A significant amount of size reduction will be necessary to package this equipment in anything other than bulk packaging.

Filter plenum FP502 has four stage HEPA filtration (8 filters per stage, and 8 mist eliminators) that support the process area or the radioactive contamination area. The FP 502 plenum dimensions are 10'H x 15'W x 35'l, with support structure inside for the four stages of HEPA filters. A significant amount of size reduction will be necessary to package this equipment in anything other than bulk packaging.

Associated with the HEPA filtration fire suppression system in Building 875, is T501, HEPA filter plenum deluge tank. This tank has a capacity for 1,240 gallons and is filled with approximately 75,000 raschig rings. This tank also has an approximate 200 ft of ancillary piping and equipment. The T501 deluge tank is approximately 7' in diameter and 7' in height. A significant amount of size reduction sill be necessary to package this equipment in anything other than bulk packaging.

Table 12-1 Projected waste generated Building 875 Remediation

IDC	Description	Volume	Comments
480	Light metal	20 full waste crates 200 fifty five gallon drums 3 cargo containers	radiological surveys, and Safeguards scans will determine the extent of size reduction necessary to package this waste
490	HEPA filters	10 filter coffins 7 full waste crates	packaged into filter coffins prior to counting , packaged into waste crates after counting
441	Raschig rings	70 fifty five gallon drums, 14 half size waste crates	sample analysis will determine packaging for raschig rings
337	plastic	2 full waste crates 10 fifty five gallon drums	Safeguards scans will determine packaging
336	moist combustibles	1 half size crate 5 fifty five gallon drums	Safeguards scans will determine packaging

13.0 Conclusion

Waste generated by the Closure Project will be packaged as efficiently and effectively as possible to maximize the utilization of approved waste containers, and utilize recycle programs to minimize the amount of waste generated.

The Building 886 Closure Project will comply with RMRS, and waste repositories' waste acceptance criteria for waste generated. Waste will be packaged to comply with the packaging configurations identified in the Waste Operations procedures. It will also be packaged to comply with the radiological engineering procedure for surface contaminated objects. The Project will utilize the most efficient and effective packaging and radiological characterization to support the disposition and disposal of waste.

The Project will comply with nuclear material accountability requirements as stated in the Building 886 Material Control and Accountability (MC&A) Plan. Waste will be measured by the accepted methodology to provide accountability to the nuclear materials and accountability organization.

Property that is identified as excess during the Closure Project will be accounted for in the Property Equipment Management Systems (PEMS).